

Getting Started with ECOpoint™

For ECO2 and ECO-14

A Supplement to the ECO™ Manual



PRC HEADQUARTERS

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ELECTRONIC INTERFERENCE INFORMATION

This device complies with Part 15 of the FCC Rules. Operation is subject to two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning! Changes or modifications to this product which are not authorized by Prentke Romich Company could exceed FCC limits and negate your authority to use this product.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. You can determine whether this product is causing interference in your radio or television by turning this product off. If the interference stops, it was probably caused by this product or one of its accessories. You can attempt to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move this product to one side or the other of the television or radio.
- Move this product farther away from the television or radio.
- Plug this product into an outlet that is on a different circuit from the television or radio; that is, this product should be controlled by different circuit breakers/fuses from the television or radio.
- If necessary, contact a Prentke Romich Company service technician for assistance.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This device contains FCC-ID POOWML-C40. Bluetooth QD ID B013848

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respect toutes les exigences du Règlement sur le matériel brouiller du Canada.

Tobii/ATI has tested the eye-tracker system to comply with IEC/EN 60825-1/A1-A2 class 1 LED products intended to be used for long time exposure. (COGAIN 2007, Intertek ETL Semko 2005)

CLASS 1 LED PRODUCT –The Tracker Headpointing option falls within the limits of a Class 1 LED product as specified by CENELEC EN 60825-1, Amendments 1 and 2.

CE ENVIRONMENTAL INFORMATION: Use: 0° - 45° C; Storage: (-20°) - 50° C; 95% maximum relative humidity @ ambient temperatures less than 40° C.



Attention! Consult accompanying documents.

This device not intended to be an emergency call device or sole communication device.



Warnings!

When operating this device in a medical environment, do not use with any product that is not medically approved. Follow the medical environment's rules for infrared, computer and cell phone use.

Any mounts used should be fitted by a qualified person. Failure to install the mounting system according to the manufacturer's instructions may result in an injury to the user.

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Extremely Important—Before You Begin

Skip this section if ECOpoint is already mounted on your ECO.

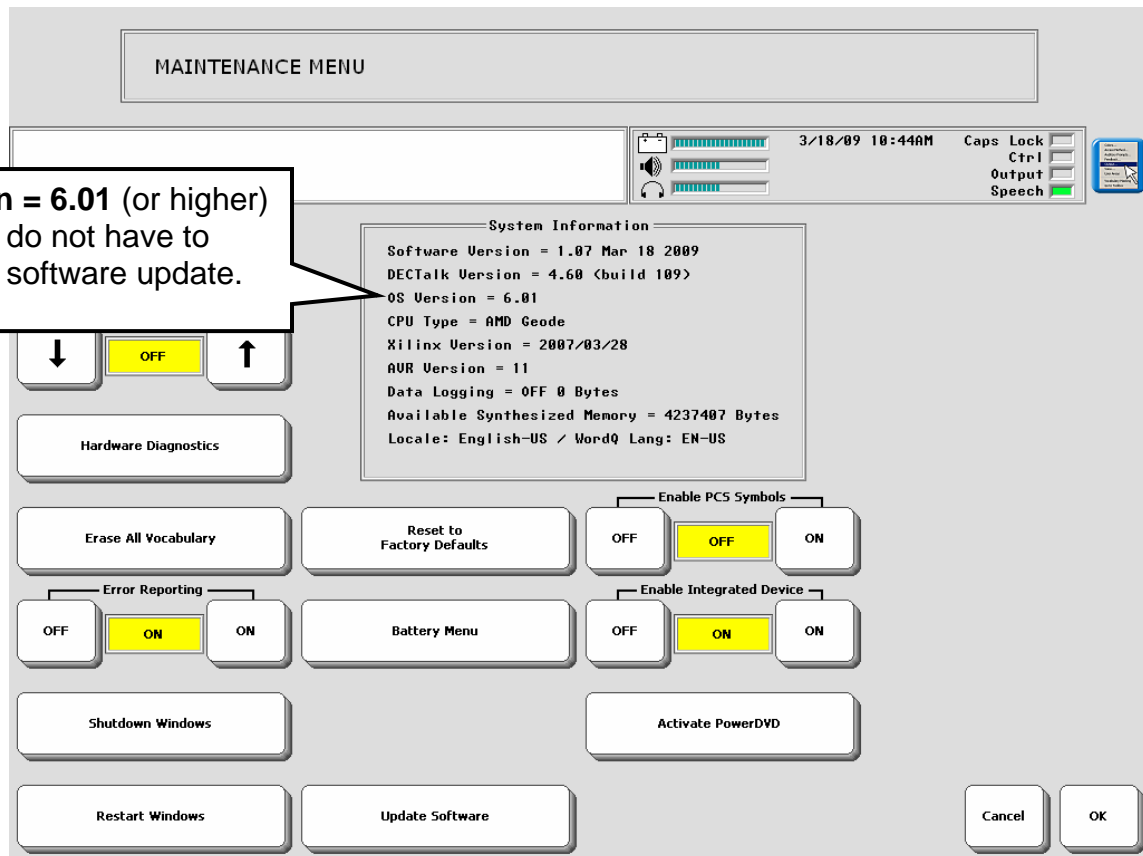
Go to page 14 to learn about positioning your system; page 27 to learn about calibrating the ECOpoint; and page 29 for more system and setting options.



**If the ECOpoint is NOT MOUNTED on your ECO
you MUST follow the directions below!**

On your ECO, go to the Toolbox and open the **MAINTENANCE MENU**.

In the **System Information Box**, look for the **OS version** number.



If the OS version is listed:

If the OS version number is **6.01 or above**, you do not have to update software. Go to the instructions for attaching ECOpoint beginning on page 7.

If the OS version is lower than 6.01 or is not listed at all:

If you **do not** see the **OS version** listed, or it is lower than 6.01, **you MUST update your software before you mount the ECOpoint system on your ECO.**

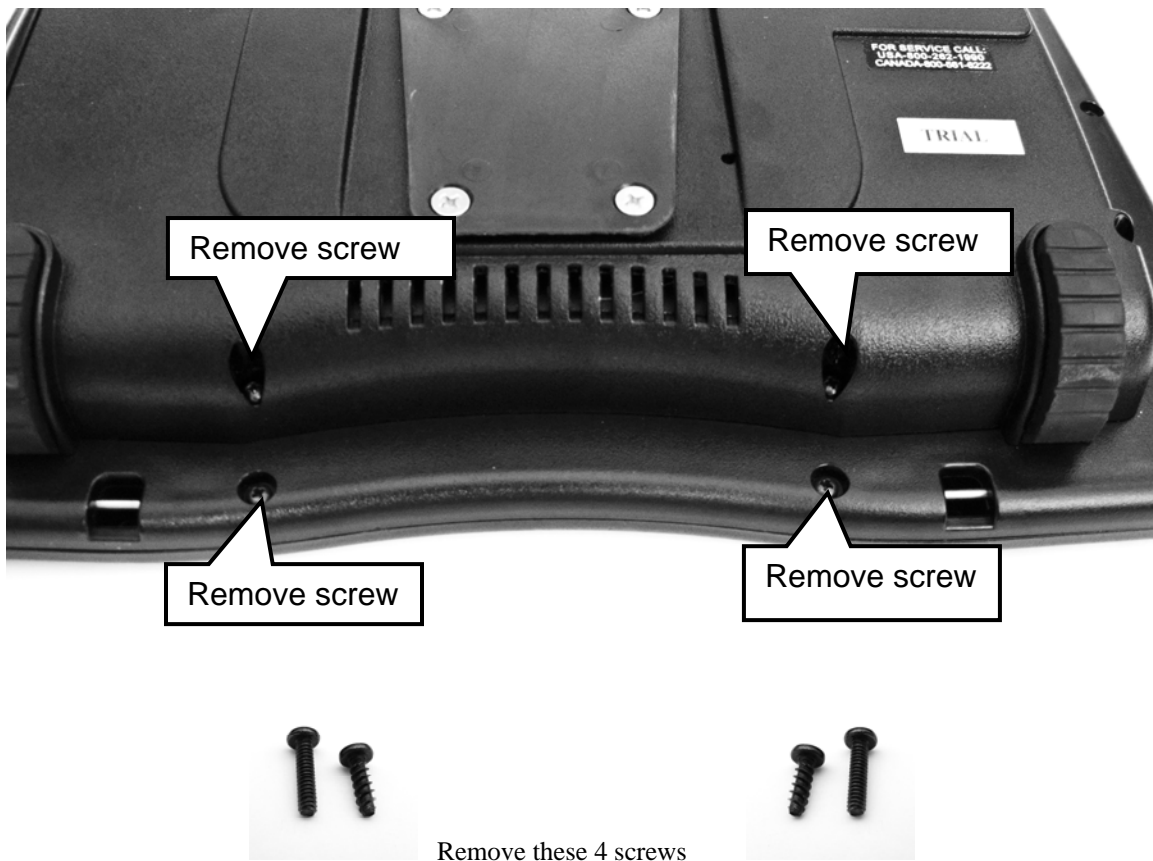
To Update Software:

1. **Back up the vocabulary** in your ECO by performing a Memory Transfer. See the **TRANSFER MEMORY MENU** chapter in the ECO User Manual on the support CD or use this link for instructions about memory transfers.
<http://support.prentrom.com/article.php?id=478>
2. When the vocabulary is backed up, find the **ECO RESTORE DISK** and the instructions for using for it that came with your ECOpoint unit.

➡ **If you already have a Restore Disk** for your ECO, you will need to use the disk that has the **latest version number** on it. For instance, if the version number for one of your disks is 1.05 and the version number on the other disk is 1.07, use the Restore Disk with the highest version number.
3. **FOLLOW THE RESTORE DISK INSTRUCTIONS EXACTLY AS THEY ARE WRITTEN.**

When the Restore Disk process is completed, you can mount the ECOpoint system on your device. See the next page.

Mounting the ECOpoint System on your ECO



⚡ Before you start: Make sure the ECO is OFF.

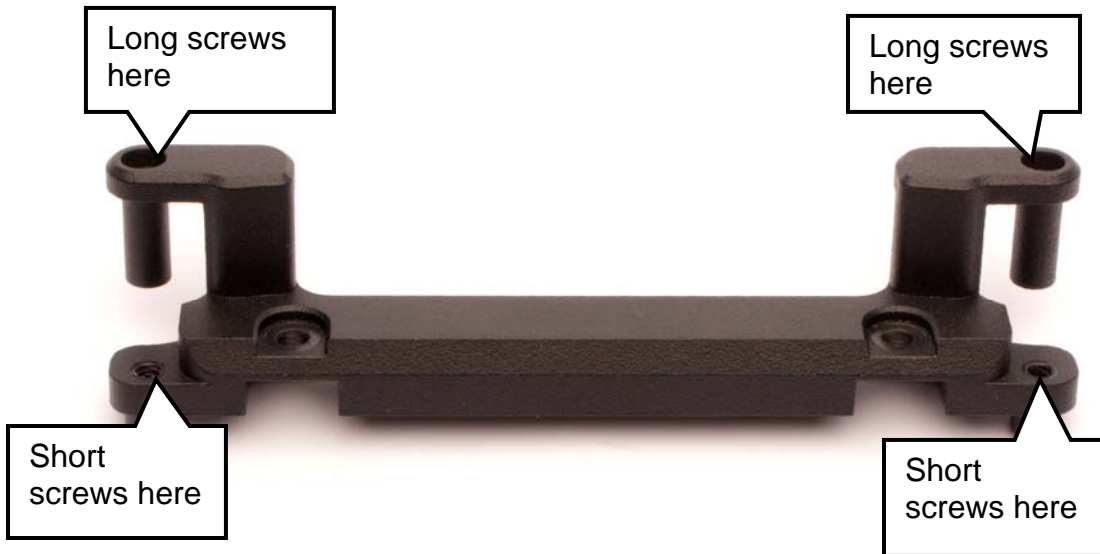
Turn the ECO OFF.

Carefully place the ECO face down on a flat surface.

Remove the four screws (shown above) from the back of the case

You will not need these screws **unless** you remove the ECOpoint system from your device. We suggest you put the screws in a small bag and label the bag in case you need the screws at a later date.

Remove the bracket and the four black screws from the ECOpoint parts bag. There are two long screws and two shorter screws.

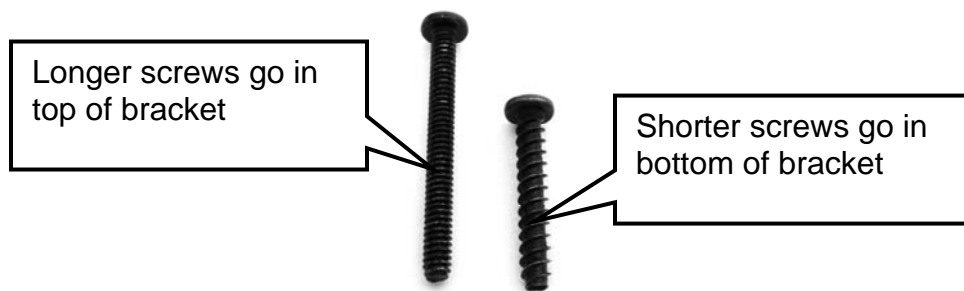


Do not put the screws in yet.

The longer screws will go on top of the bracket

The shorter screws will go on the bottom of the bracket.

Do not attach screws yet.





Fit the small round posts on the top of the bracket into their holes on the ECO case.

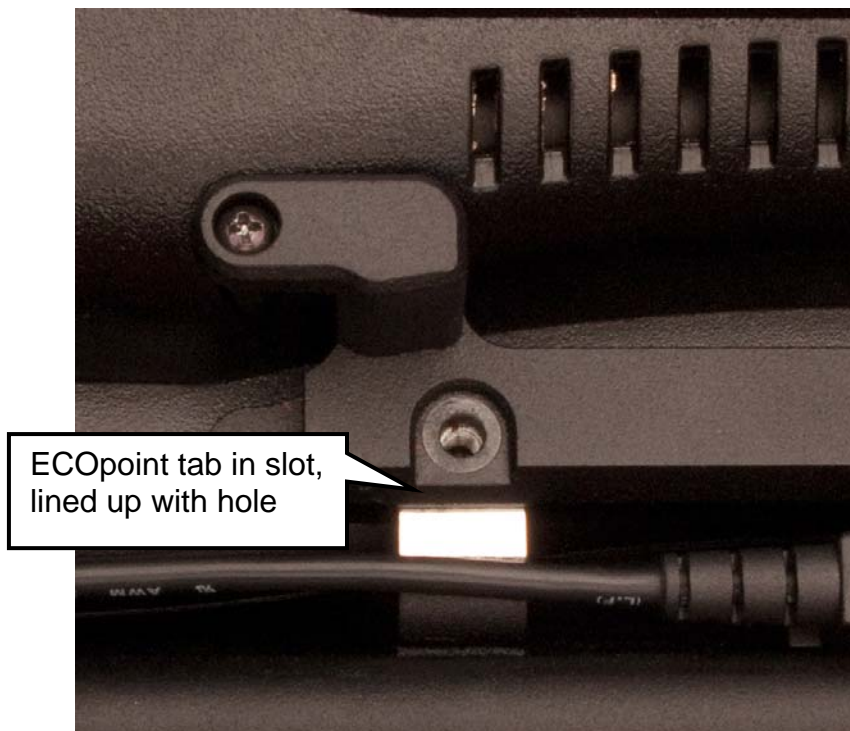


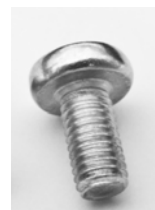
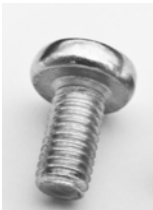
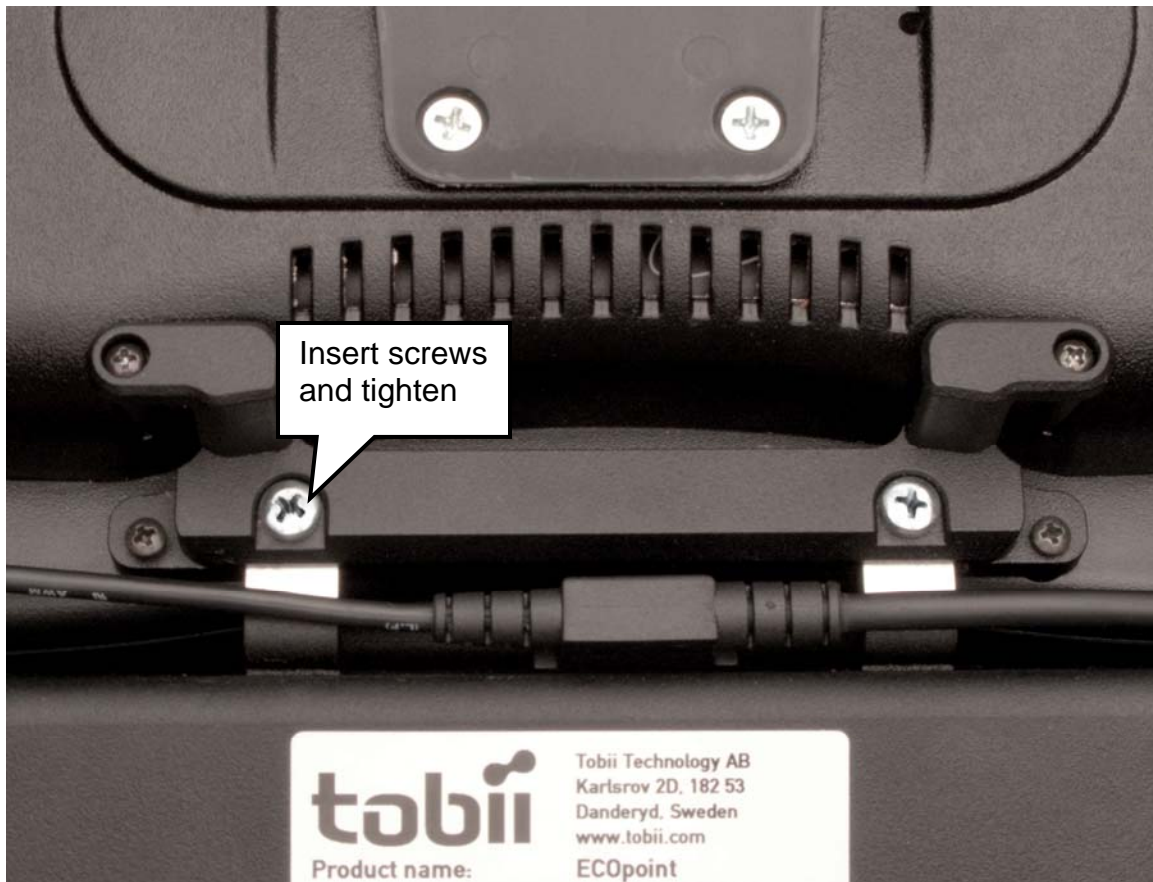
When the posts are secure in the holes the bracket looks like the picture above.
Place the long screws in the top holes and the short screws in the bottom holes.
Tighten the screws until the bracket is secured to the ECO case.



Pick up the ECOpoint unit. Make sure the label is visible to you. (See picture above)

Slide the tabs on the ECOpoint unit into the slots available for them in the ECO case.





Find the silver screws in your parts bag.

Place them in the holes in the bracket.

Tighten the screws so that the ECOpoint unit is secured to the tabs, the bracket and case.

ECO-2 Connection

➡ Your cable **may** be slightly different from the one pictured here but it will connect to the ECO2 in the exact same way as described below.



Plug the power cable into the hole on the right side of the case (as you are now looking at the device.)



Plug the USB end of the cable into the USB port on the back of the case to complete the assembly.

ECO-14 Connection



Plug the power cable into the hole on the right side of the case (as you are now looking at the device).



Plug the USB end of the cable into one of the USB ports on your ECO to complete assembly.

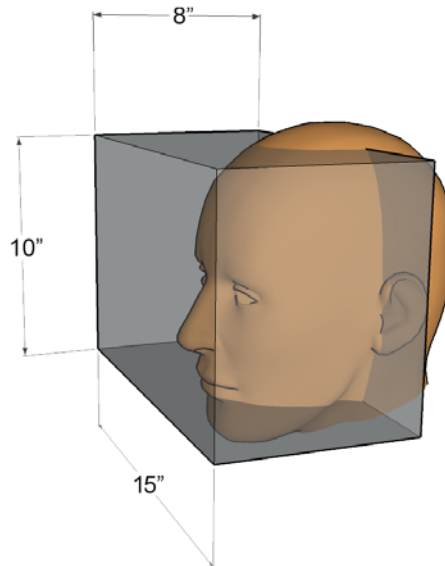


Positioning the ECOpoint

➡ The positioning of the ECOpoint system in relation to the user is extremely important. The goal of positioning is to achieve a stable eye image for the ECOpoint to track. Because of this you will probably have to try out different positions. Once you begin setting options you may have to refine the positioning again. When the image of your pupils is stable you are ready to use the system.

ECOpoint System Parameters

The ECOpoint "eyebbox" is measured at 10" x 15" x 8". As long as your eyes are within this area you are in the view range of the ECOpoint. At this time you must be positioned 20 to 24 inches from the ECO screen. ➡ If you move in and out of the view area, the system will "remember" you. This means that once you set up the system you should not have to recalibrate it because of body movement.



Imaginary Eyebox (or Gazing Area)

The ECOpoint eyebox is 10" x 15" x 8". As long as your eyes are within this area you are in the view range of the ECOpoint. At this time, you must be positioned 20-24 inches from the ECO screen. If you move in and out of the view area, the system will "remember" you. This means that once you set up and calibrate the system, you should not have to recalibrate because of body movement.

The positioning mount should be both sturdy and adjustable.

Meeting the following positioning requirements will help you achieve success with the ECOpoint system:

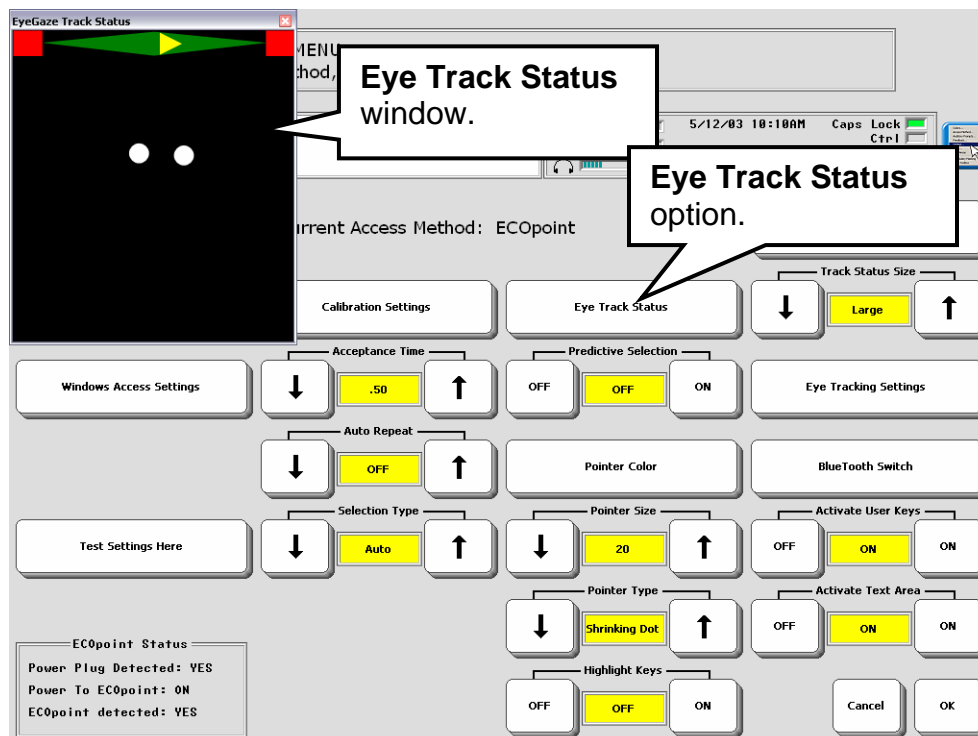
1. You must have one eye (preferably two) within the eyebox.
2. You should be between 20 and 24 inches from the ECO screen.
3. Your nose must be aimed at, or slightly above, the midpoint (or upper 2/3ds of the ECO screen.
4. Your face must be straight-on to the ECO screen. If you are tilted due to positioning or posture, the ECO/ECOpoint must be tilted at a similar angle so that your face is directly in front and within 20-24 inches of the ECO.
6. There can be no obstructions between your face and the ECO/ECOpoint.

Mount the ECO with the ECOpoint attached securely to the mount you are going to use.

- Once you have the whole unit mounted securely, turn your ECO **ON**.



- Go to the Toolbox and select the **ACCESS METHOD MENU**
- Select the **ECOpoint** option.
- Select the **Eye Track Status** option. You will use the Eye Track Status window to help find the best positioning for your ECOpoint and yourself.



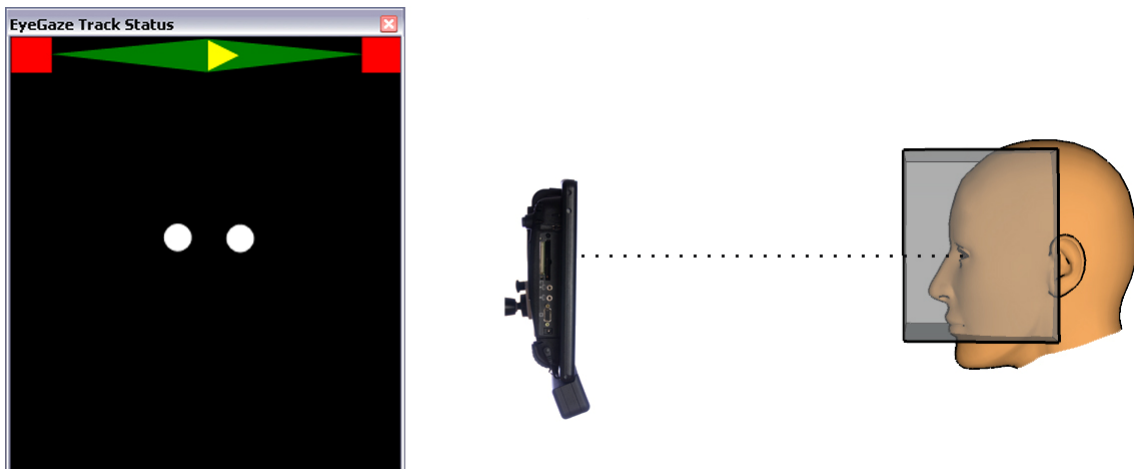
ECOpoint is designed to track where your eyes are looking. It is most accurate when your eyes are centered inside an imaginary box that is 15 inches wide, 10 inches high and 8 inches deep. The center of this box is located approximately 22 inches from the screen of the ECO

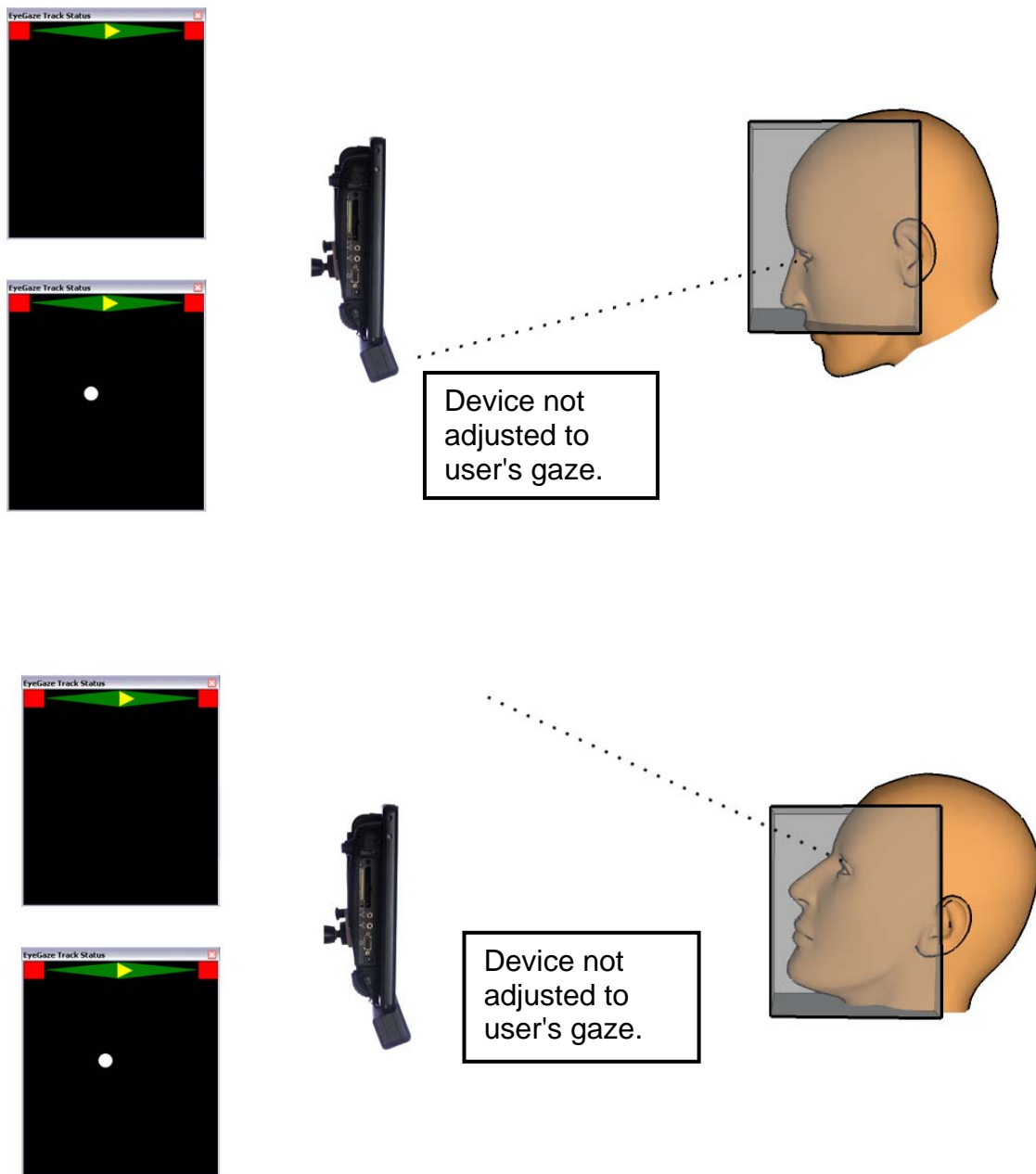
The **Eye Track Status Window** allows you to see if your eyes are within the ECOpoint's field of view.

When the track status window is open, you should see two white circles on a black background. If you physically have only one eye, you will see a single circle. The circles may move as your eyes move but they should not be "flickering". If "flicker" is present, it is most likely that you will have to adjust the position of the user or the device.

Positioning

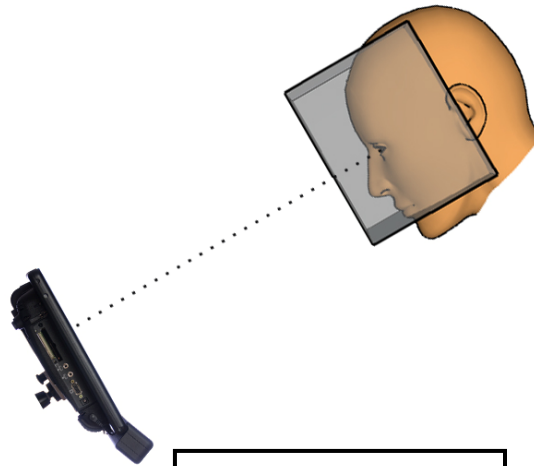
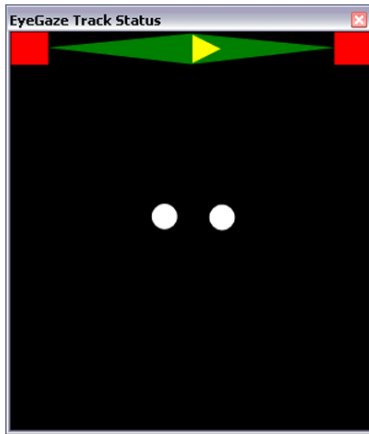
Adjust the angle of the device until the front of your face and the display are parallel.



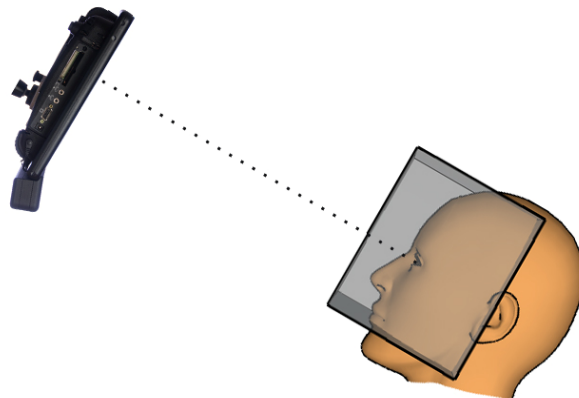
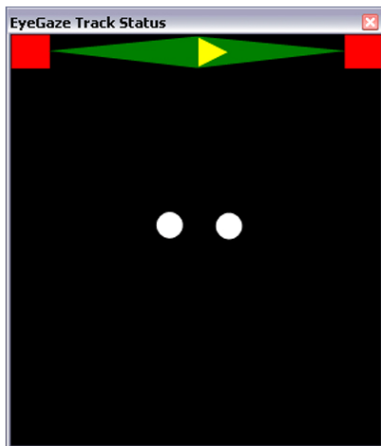


INCORRECT POSITIONING

Both of the above positions are incorrect. The device has not been adjusted for the user's position. Notice the Eye Track Status window. There are either no white circles (your eyes) visible or there is only one circle. (These pictures assume you have both eyes; if you physically have only one eye, you will see only one circle.)



In both illustrations,
device is adjusted
to user's gaze

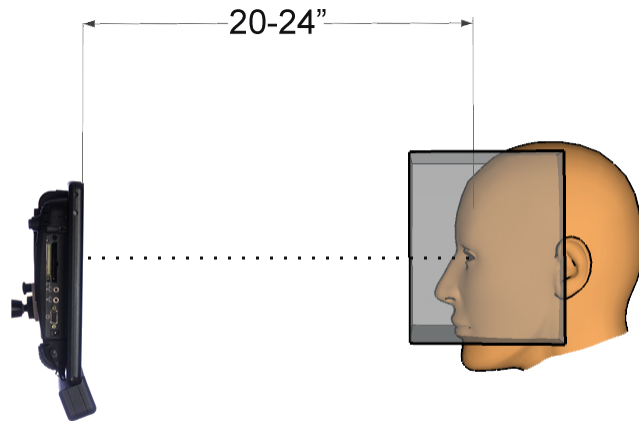
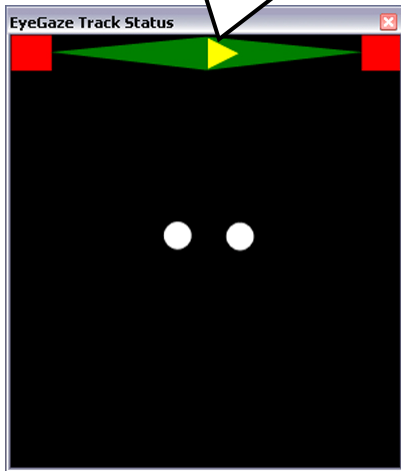


CORRECT POSITONING

In these graphics, the ECO has been adjusted for the user's position. Notice that the white circles in the Eye Track Status window are now aligned.

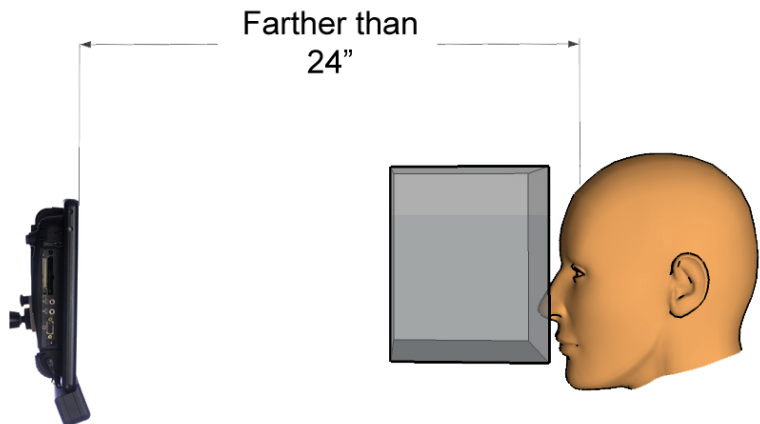
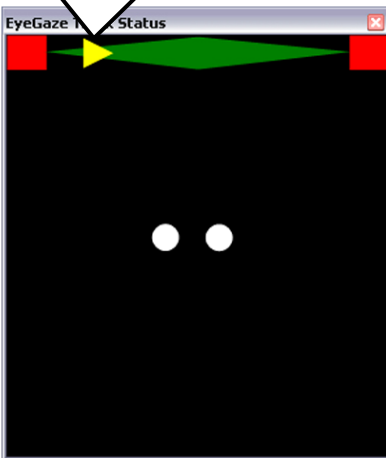
Your eyes should be between 20 and 24 inches from the screen.

When the yellow triangle is in the center your **distance position** is correct.

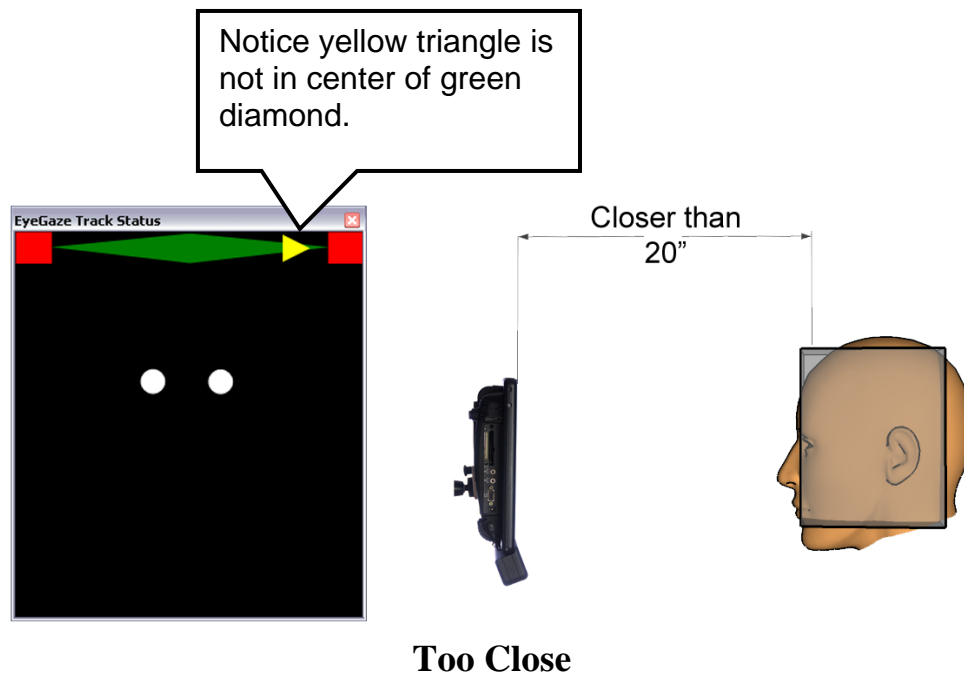


The yellow triangle shows your distance position inside the imaginary box. Adjust your distance from the ECO until the yellow triangle is at the widest (center) part of the green diamond.

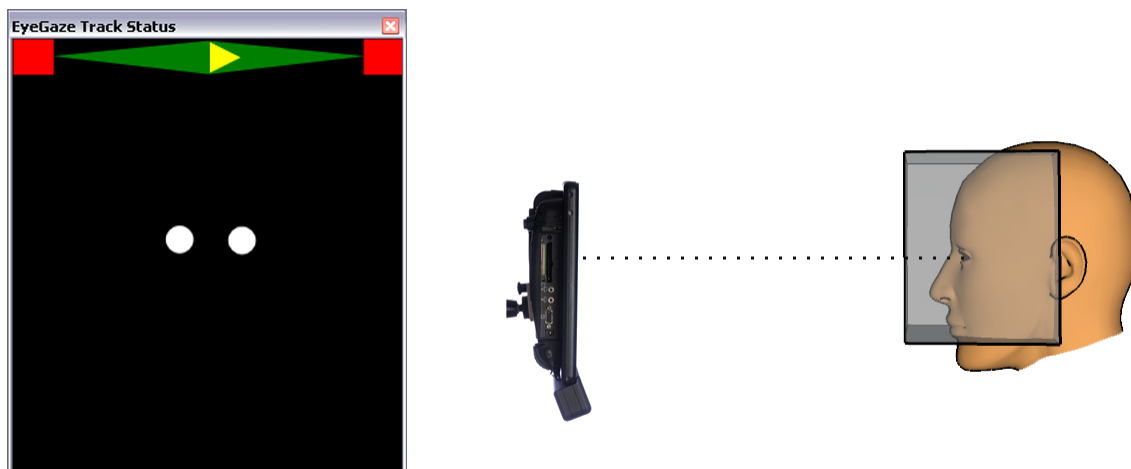
Notice yellow triangle is not in center of green diamond.



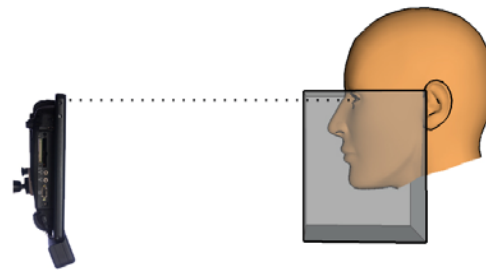
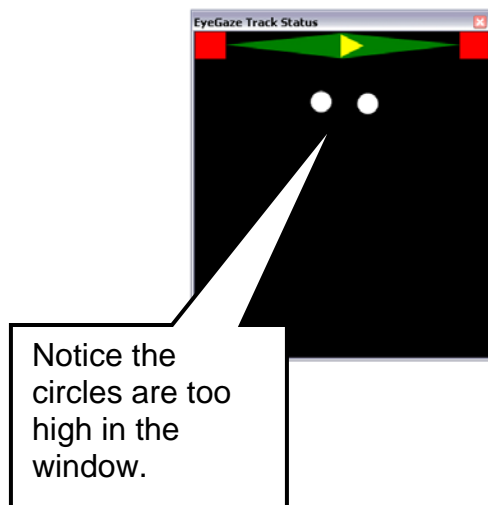
Too Far



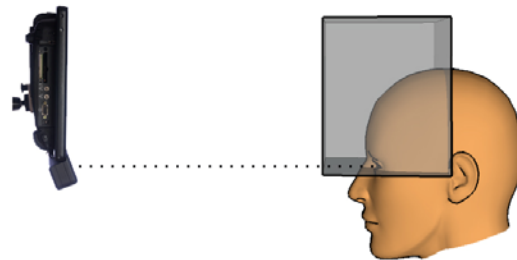
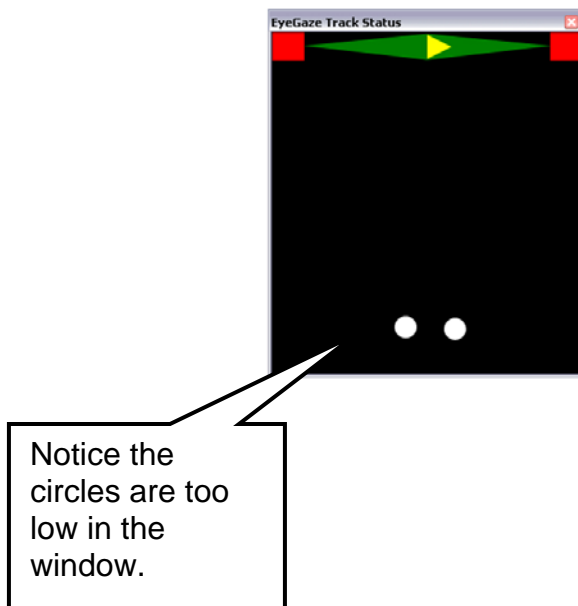
Your nose should be pointed at the vertical middle of the screen and your eyes should be looking at the top 1/3rd of the screen.



The yellow triangle is centered in the green diamond and the white circles are a little above the center of the window.



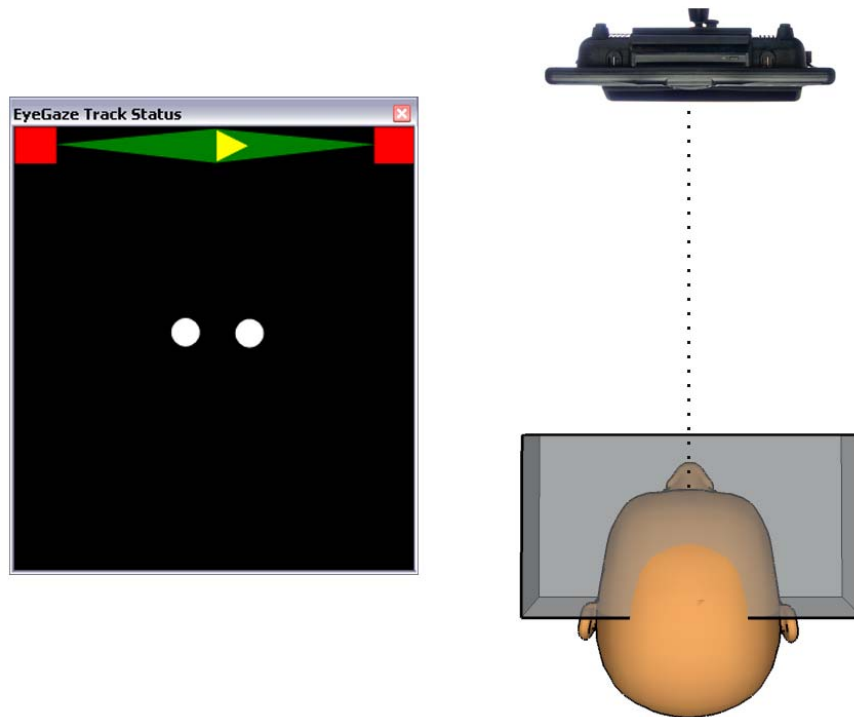
Too High



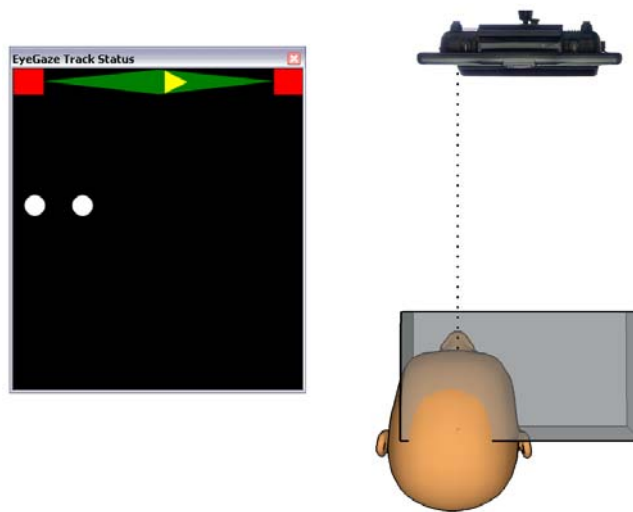
Too Low

The white dots show the relative position of your eyes inside the imaginary box. Adjust the vertical position of your ECO until the dots are vertically centered in the black box.

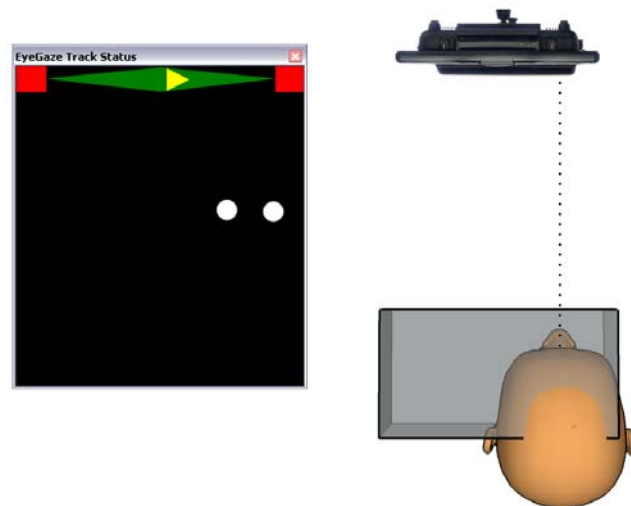
Your nose and eyes should be pointed at the horizontal center of the screen



Graphic is looking down on user and device. The eyes and nose are pointing toward the center of the device.



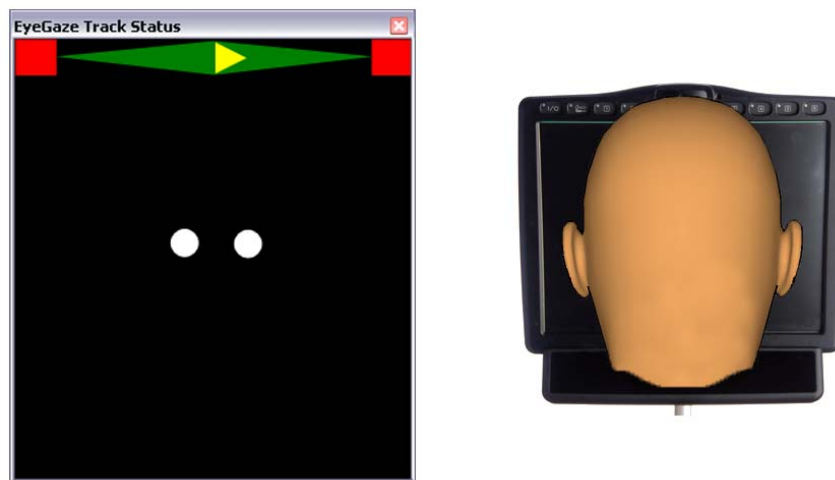
Too Far Left



Too Far Right

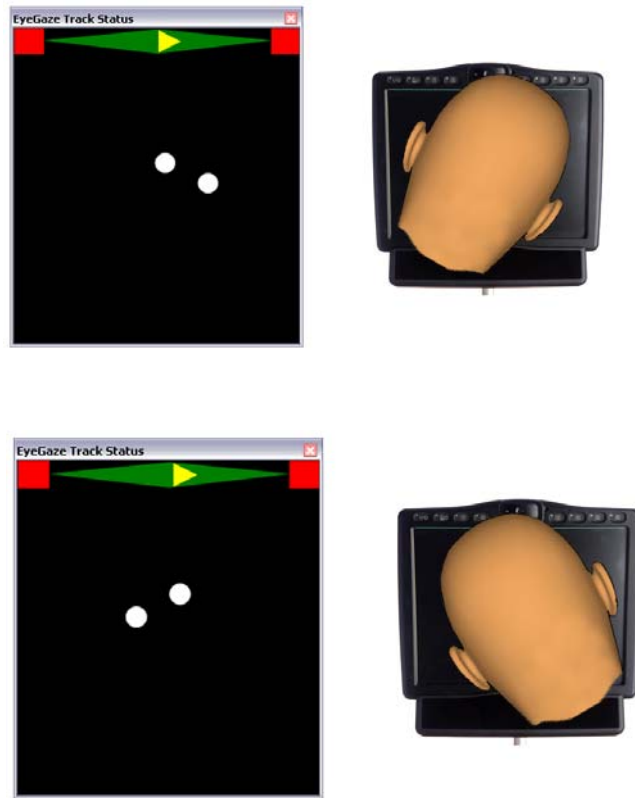
Look at the Eye Track Status window. The white dots show the relative position of your eyes inside the imaginary box. Adjust the horizontal position of your ECO until the dots are horizontally centered in the black box.

The vertical and horizontal axes of the ECO should be aligned with the vertical and horizontal axes of your head.



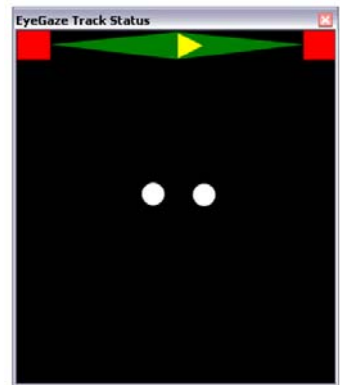
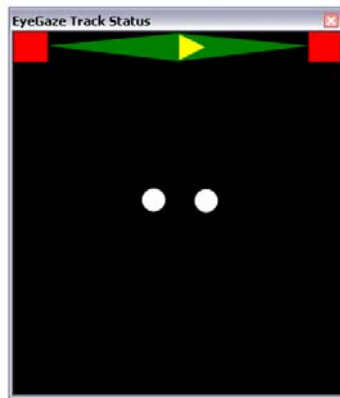
In this graphic the head is horizontally and vertically aligned with the ECOpoint system. Notice the white circles are aligned in the Eye Track Status window and the yellow arrow is in the center of the green diamond.

If your head is tilted to the left or right, tilt the ECO to match the angle of your head.



Incorrect

Notice the white circles in the Eye Track Status windows. They show the relative tilt of your eyes inside the imaginary box. The ECO has not been adjusted for this tilt.



The Postions in both Graphics are Correct

In these graphics, the left-right tilt of the ECO has been adjusted to match the user's position. The white circles are now horizontally level in the Eye Track Status window.

You are now ready to calibrate the system.

Calibrate the ECOpoint

☞ Before you calibrate your ECOpoint, make sure you have used the **Eye Track Status** window to help correctly position the user and the ECOpoint. See pages 14-27.

☞ "Insertable Tool" under an option below indicates the option can be assigned to a key on your overlay or stored under a sequence using the Insertable Tool function. These options are specifically helpful for ECOpoint. ☞ See the **Store/Assign Tools...** chapter in your manual for information about assigning Tools to keys.

If you are not already in the ECOpoint menu, do the following:



Open the **ACCESS METHOD MENU**.

If the menu does not open to the ECOpoint page, select **ECOpoint**.

Select the **Calibrate Now** option.

Calibrate Now

Insertable Tool: CALIBRATE ECOPOINT

Let your eyes follow the target around the screen.

The 5-point calibration process allows ECOpoint to track and learn your eye-gaze. Default calibration settings will be used unless you change the settings in the **Calibrate Settings** option. When the calibration is finished, select **OK**. You can begin tracking with ECOpoint once the pointer appears.

If you have problems using the system after calibration, try making adjustments in any of the following options.

Eye Track Settings

Adjust these settings if you wear glasses.

Using Glasses

If you wear glasses while you use the ECOpoint system, answer **YES**. If not, reply **NO** and **OK** to close the menu.

Right and Left Diopter:

This is your glasses prescription. If you answered **YES** to **Wearing Glasses**, fill in the diopter number for your right and left eyes. You can ask your eye doctor for these figures. They can be positive or negative. If you are not wearing glasses, do not fill in these two options.

Calibration Settings

The options in this menu help personalize the ECOpoint system for your eyes.

As you experiment with some of these options you may also have to re-work the positioning of the system.

Choose the settings you want and select **OK**. Then select the **Calibrate Now** option to perform a calibration.

Stimulus Type: Point, Image

If you select **Image** or **Video** you must have an Image or Video file stored in your device or a USB flash drive to be displayed.

Image files are recommended when a user has difficulty looking specifically at the Point or is better motivated by a personal image.

If you select Point you can also select a **Pointer Color**.

Stimulus Size: Small to Large

This increases or decreases the size of the point, image or video that is being displayed during calibration. ➡ For the most accurate calibration it is best to use a smaller point or image.

Stimulus Speed: Normal, Fast, Very Fast, Slow, Very Slow

Adjust this option if there are motor issues with the eye's ability to perform smooth pursuits. ➡ If an individual has visual tracking problems, we suggest you decrease the speed of the stimulus.

Active Eye: Both, Left, Right or Single Eye.

Both means that ECOpoint will track both your eyes as you look at the screen; **Left** or **Right** means that ECOpoint will see both your eyes but will track only the eye that you have selected in this option; select **Single Eye** if you have only one eye (e.g., you wear a patch over one of your eyes or have lost an eye).

Stimulus Sound: YES (on), NO (off)

If the sound is on, you will hear a beep at the end of a gaze point calibration.

Keyboard Step-through: YES (on), NO (off)

Allows the user to step through each calibration point manually. A USB keyboard must be plugged into the ECO in order to use this option. You must use the "s" key on the keyboard to step through the calibration.

Calibration Area: Large, Medium or Small.

Select the area of the screen that you want to use for calibration. The size you select is only for eye-tracking calibrations; you will be able to use the whole screen when you are actually using the ECO with the ECOpoint system.

You may want to select a calibration area, do the calibrations and then practice on the ECO screen. You may have to try out the all the calibration areas before you find and are satisfied with the one that will work best for you.

Eyegaze Calibration: Per User Area or Global.

This determines if the eyegaze is calibrated once for the entire device (Global) or if each User Area has its own calibration (Per User Area).

Select Background Color:

You can select a color for the calibration area. This is useful if you have visual problems that are helped when you are looking at certain colors.

Select Pointer Color:

If you select **Point** for your **Stimulus Type**, you can select a Pointer color.

Select Image:

You can select an icon to use as the image you look at when you are calibrating your ECOpoint. If you do not want to use an icon you can select an image you already have stored on a USB drive or a folder on your ECO. This is useful if your eyes track an image better than a dot or point.

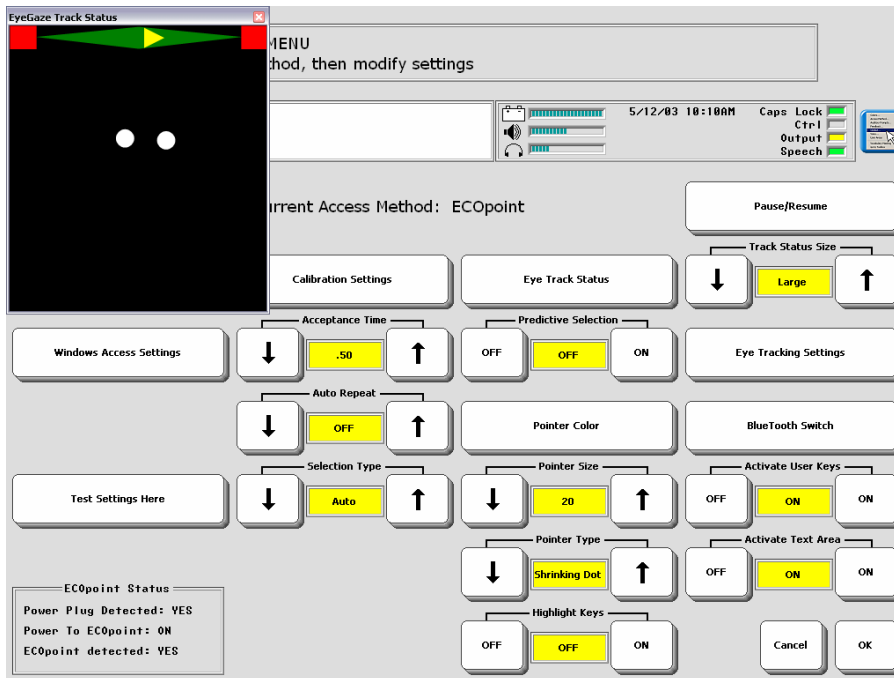
Other ECOpoint Access Method Menu Options

Eye Track Status**Insertable Tool: ECOPOINT EYE TRACK STATUS**

See pages See pages 14-27. for more information about this option.

This option allows you to open (and close) the **Eye Track Status** window to see if your eyes are within the ECOpoint's field of view.

When the track status window is open, you should see to two white circles on a black background. If you have only one eye, you will see a single circle. The circles may move as your eyes move but they should not be "flickering". If "flicker" is present, it is most likely that you will have to adjust the position of the user or the device.



You will see something similar to the picture above when you select **Eye Track Status**. At the top of the Eye Track Status box is a yellow arrow on a green background. If the user is in the view area, the arrow will be located in the center between two red boxes.

To Close the Status Window

- Select the **Eye Track Status** option in the menu;
- Click the small red box with an "x" in it in the top right corner of the status window;
- Assign the **ECOPOINT TRACK STATUS** tool to a key on your overlay to toggle the window open and closed.

Pause/Resume

Insertable Tool: DISABLE POINTER

Use this option to stop and restart the ECOpoint system while you make adjustments to ECOpoint settings and options. Only Direct Selection will work when ECOpoint is paused.



To Pause ECOpoint:

Method 1

Go to the Toolbox and open the **ACCESS METHOD MENU**

Press or gaze at the **Pause/Resume** option to set (or release) Pause.

Method 2

Gaze directly at the infrared window between the  and  keys on the front of the ECO case until **PAUSE** or **RESUME** is selected.

Method 3

Assign the insertable Tool **DISABLE POINTER** to a key on your overlay. Press the key to set **PAUSE**. Press again to set **RESUME**. ➡ See the **Store/Assign Tools...** chapter in your manual for information about assigning Tools to keys.

Pointer Color

A pointer color should help you find the pointer easily and to maintain your gaze on it.

Pointer Size

This option allows you to adjust the pointer size from 5 to 45 pixels in diameter. The default size is 20. ➡ A larger pointer size may impact an individual's ability to maintain eye contact with the target key.

Pointer Type

This option allows you to select the type of pointer you want to use. The options are **Shrinking Dot**, **Clock** and **Invisible**. You can use this in conjunction with **Highlight Keys** option. We suggest you experiment with this option to see which pointer works best for you.

Acceptance Time

This is the amount of time it takes from when you gaze at a key until the device accepts and selects the key. ➡ With ECOpoint, the Acceptance Time can often be set to a much shorter length than with other access methods (including head tracking and scanning). If you notice that the gaze cursor begins to move over the key you want, then suddenly shifts to another key before a selection can be made, you may want to try shortening your Acceptance Time. A longer Acceptance Time means you must hold your gaze on a key longer to get it selected. Generally, the eye does not like to hold still for long periods of time. The default Acceptance Time is .7 seconds.

Auto Repeat

Choose the amount of time you must look at a selected key before it begins to repeat itself. For example, if you select 1/0 of a second for the auto repeat time, you must first select a key on your overlay, then gaze at the selected key for 1/10 of a second until it begins to repeat itself. The key will repeat at 1/10th of a second intervals until you move your eyes away from the repeating key.

Selection Type

This allows you to switch between three types of selection options:

Auto means your device will automatically select the key using dwell selection which is based on the amount of time you set in the Acceptance Time option.

Switch allows you to plug a single switch into your ECO or to use the PRC Bluetooth switch to make selections.

Blink allows you to open and close your eyes for a period of time. Set the amount of time using the **Minimum Blink Duration** and the **Maximum Blink Duration** options.

Predictive Selection

This works hand-in-hand with **Icon Prediction**. (Icon Prediction is in the FEEDBACK MENU and the default is ON.)

When you turn **Predictive Selection On**, your device highlights only those icons where messages are stored. These highlighted icons are the only keys on the keyboard that will produce a response.

You can change the color of the non-active keys to grey or white. Go to the **FEEDBACK MENU**, **Icon Prediction** and select **Grey** or **White**. Grey allows you to see the shadow of the icon on the key; white turns the entire key white so it looks blank. But if you try to select a grey or white key, nothing will happen.

Note: **Icon Prediction** alone allows you to press grey or white keys. The key's icon will appear in the Icon display area but no message will be spoken. Icon Prediction will work whether **Predictive Selection** is On or not.

Highlight Keys

When this is **ON** the outside border of a key is highlighted when the key is selected.

Windows Access Settings

Use this option to turn **Windows Clicks ON**, set the **magnification** option and set **mouse sensitivity**.

Windows Clicks

Insertable Tool: WINDOWS CLICKS ON, WINDOW CLICKS OFF, WINDOWS CLICKS ON/OFF

When this is **ON**, you can make single left-click selections when you are in a Windows application.

Mouse Sensitivity

This regulates how still your gaze must be in order to execute a mouse click and make a selection. The amount of time is the **Acceptance Time** that you set in the Acceptance Time option. The higher the mouse sensitivity level the more stable your gaze must remain in order to make a mouse click. A **LOW** sensitivity level will be best for most users as the eye has a natural tendency to move around a target. The default is **NORMAL**.

As you become more experienced with ECOpoint and managing your gaze, you can increase the setting if you want to work in an environment that requires exact mouse positioning, such as CAD or spread sheet applications.

Mouse Speed

This adjusts how fast or slowly the mouse cursor responds to eye movement. Slower settings cause the cursor to lag behind your eye movement. Faster settings move the cursor at approximately the same speed your gaze is tracked. Normal settings show a little lag but move at speeds comparable to a normal desktop mouse.

Mouse Insertable Tools: NEXT MOUSE CLICK DOUBLE, NEXT MOUSE CLICK RIGHT, NEXT MOUSE CLICK HOLD.

Magnify Windows Clicks

Magnification Factor

Magnification Area

Insertable Tools: CLICK MAGNIFY ON, CLICK MAGNIFY OFF, CLICK MAGNIFY ON/OFF

Magnification works when your mouse cursor is in a Windows application.

When **Magnify Window Clicks** is **ON** you can select an area in your Windows application and it will appear in a magnified box. This makes it easier for you to select the options you want in your application.

Magnification Factor: how large do you want the area magnified—2 times larger (2X) 4 times larger (4X). Select an option then try it out till you find the size that works well for you.

The **Magnification Area** (in number of pixels) is the size of the area you are magnifying. We recommend that you select different numbers for Factor and Area and try them out in an application on your ECO. You'll then have a good idea of what works for you.

There is a 2-click rhythm for using Magnification:

Click on the option or menu you want.

Click it again to open or select it.

Click on the option or menu you want.

Click it again to open or select it.

Continue with this idea until you and your ECO have performed the action you want.



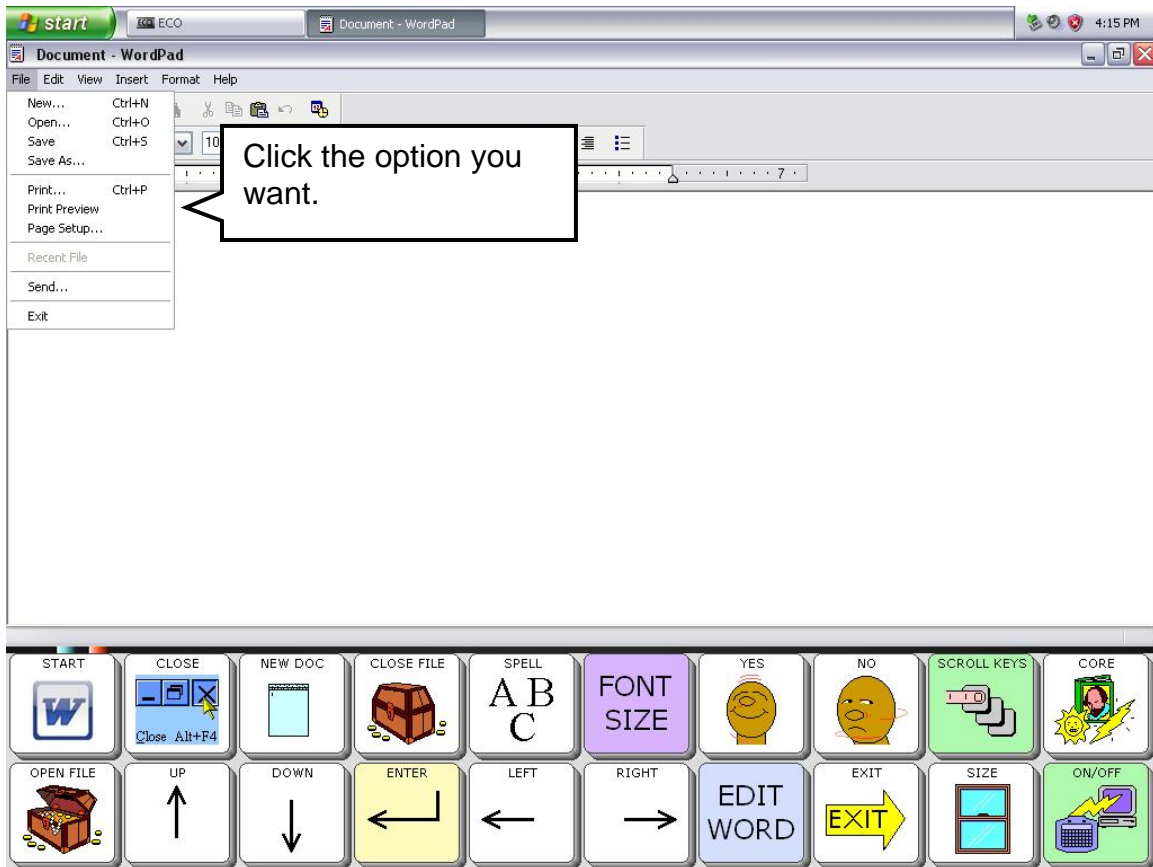
Your overlay may be different

To open the File menu in the Word application:

Click on (or select with your access method) the "File" menu.

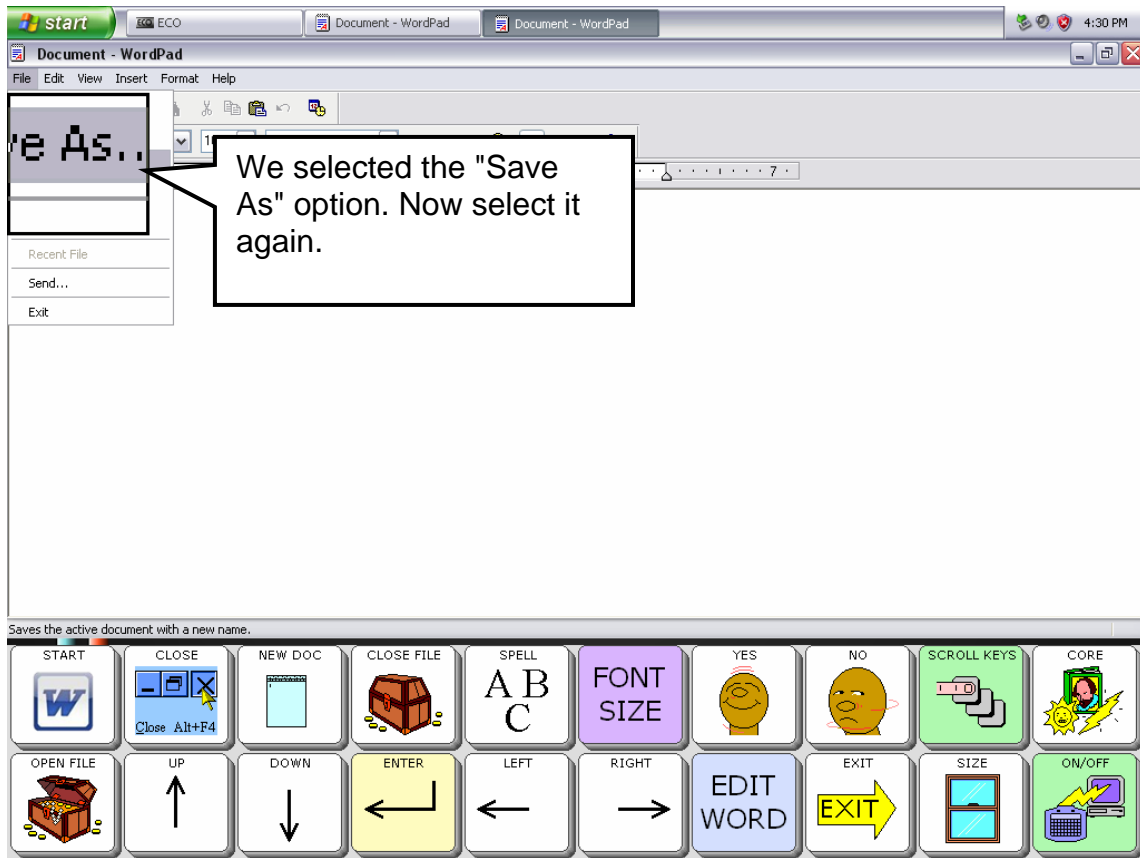
The word "File" will show up magnified in a box.

Click on the word "file" in the magnification box to see the whole File menu.



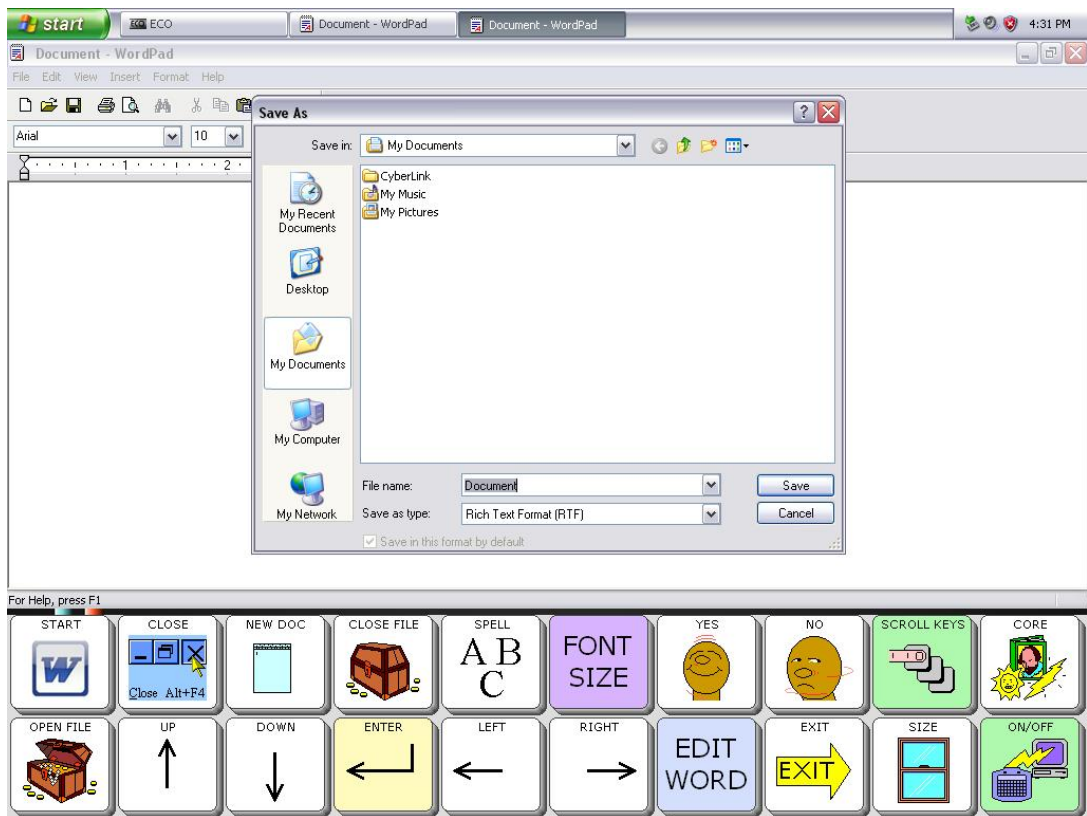
Your overlay may be different

Now you can click on an individual File menu option.



Your overlay may be different

Select the magnified "Save As" option.



Your overlay may be different

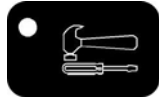
You see the "Save As" menu.

Continue to click and select until you have completed the action you want to accomplish.

Diagnostics Menu

If you have trouble with your ECOpoint system, you should call the PRC Service Department (800-262-1990). There are a couple of options in the **ECOpoint Diagnostics** menu you can try before calling them, however.

Go to the Toolbox

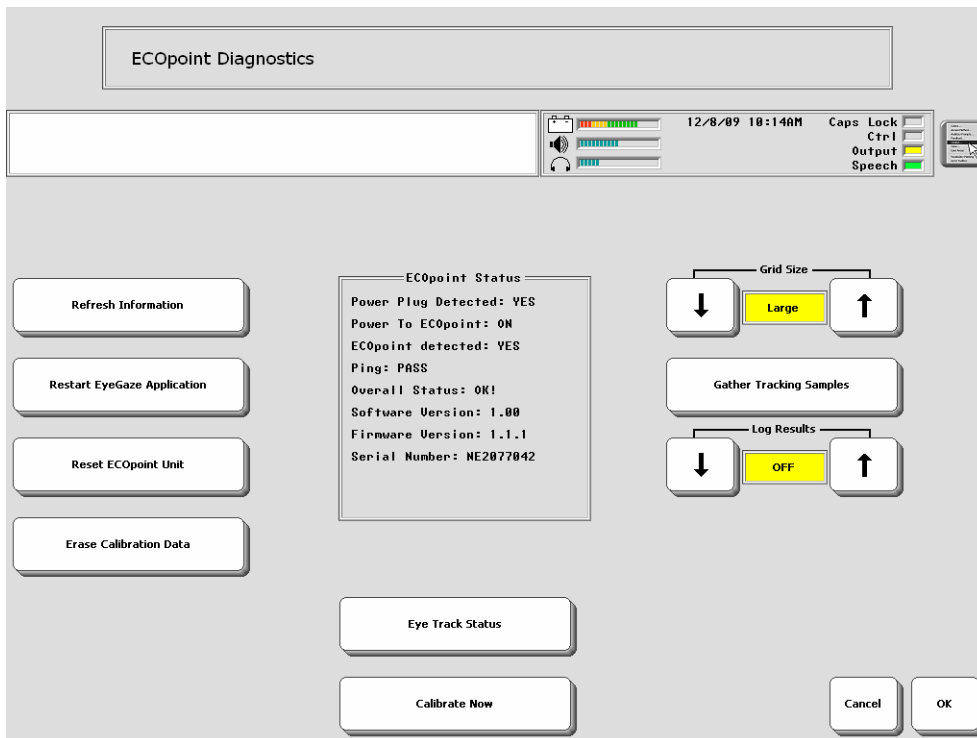


Select the **MAINTENANCE MENU**



Select the **Hardware Diagnostics** option.

Select the **ECOpoint Diagnostics** option.



Refresh Information

Service may ask you to select this option and then to read off the information in the box in the center of the menu.

Restart EyeGaze Application

If your ECO is functioning correctly but your ECOpoint is not, you may be asked to try this option. This unloads the Eyegaze software and reloads it.

Restart EOPoint Unit

This takes the previous option one step further. It unloads the EyeGaze software, powers down your EOPoint, powers up the EOPoint and then re-loads the software.

➡ The **Restart Eyegaze Application** and **Restart EOPoint Unit** are both options you can try on your own.

Erase Calibration Data

This erases the stored calibration data for all Areas. You must recalibrate your unit after using this option.

Eye Track Status

Calibrate Now

Both of these options are the same ones you use in the EOPoint menu. They are here for convenience.

Grid Size

Gather Tracking Samples

Log Results

If necessary, your PRC Service Technician will walk you through these options.

Practice

As with most things, the best way to become adept at using the tracking system is to practice with it. The device needs to get used to your eyes and your eyes need to get used to the ECOpoint. If you don't expect perfection right from the start, the mistakes that come with the learning process will not be so frustrating.

You may find that you have to fine tune the positioning of the ECOpoint. If so, remember to use the **Eye Track Status** window and then recalibrate.

If you feel yourself getting frustrated or tired, move away from the ECOpoint (out of tracking range). When you look at anything for long periods of time without moving much, it is always good to take periodic breaks.